

## Summary of Charbert Hydrogen Sulfide Data – June 21 - June 28, 2004

The Rhode Island Department of Environmental Management (RI DEM) is currently operating two continuous hydrogen sulfide monitors in the neighborhood adjacent to the Charbert facility in Alton. The monitors are located in sheds on the properties of 10 Woodville-Alton Road, across Alton Pond from the facility and 16 River Street, adjacent to the Charbert lagoons

As in the previous two weeks, substantially elevated levels of hydrogen sulfide were recorded frequently during the period of June 21 - 28 at the River Street location. On six of the seven nights during that period, the concentrations were elevated during all or part of the late night- early morning hours. In addition, elevated concentrations occurred during the afternoon of Tuesday, June 22<sup>nd</sup> and briefly during the afternoon of Thursday, June 24<sup>th</sup>. At all times that elevated concentrations were observed, the wind conditions were either calm or from the south, the direction of the lagoons. Conversely, on the night that the concentrations were not elevated, Tuesday June 22<sup>nd</sup> to Wednesday June 23<sup>rd</sup>, the wind was from the north – northwest, away from the lagoons. Concentrations were lower at the Woodville-Alton Road location. Specifically:

- ◆ Hydrogen sulfide levels on River Street were elevated from 1:30 to 2:00 AM and again from 4:30 to 7:00 AM on Tuesday, June 22<sup>nd</sup>. The highest 10-minute reading during that period, recorded at 6:50 AM, was 49 ppb and the highest one-hour average concentration was 29 ppb. Concentrations at the Woodville-Alton Road location were not elevated that morning.
- ◆ Hydrogen sulfide levels at the River Street monitor were elevated from 12:30 to 4:00 PM on Tuesday, June 22<sup>nd</sup>. The highest ten-minute average, recorded at 3:15 PM, was 44 ppb and the highest one-hour average was 28 ppb. Concentrations at the Woodville-Alton Road location were not elevated that afternoon.
- ◆ Hydrogen sulfide levels on River Street were frequently above 10 ppb between 9:30 PM on Wednesday, June 23<sup>rd</sup> and 6:00 AM on Thursday, June 24<sup>th</sup>. The highest reading recorded during that period was 90 ppb, recorded at 4:30 AM. Note that 90 ppb is the upper end of the range of concentrations that can be measured by the instrument in its current configuration, so the concentration for that 10-minute period may actually have been above 90 ppb. All other concentrations were below 90 ppb. The highest one-hour average concentration during that period was 75 ppb. Concentrations at the Woodville-Alton Road location were slightly elevated (concentrations of 5 – 15 ppb) from 12:00 – 2:00 AM on June 24<sup>th</sup>.

- ◆ During the late night - early morning of Thursday, June 24<sup>th</sup> to Friday, June 25<sup>th</sup>, elevated hydrogen sulfide concentrations were recorded at the River Street location frequently between 11:30 PM and 9:45 AM. The highest reading during that period was 38 ppb at 2:54 AM and the highest one-hour average concentration was 31 ppb. The highest concentration at the Woodville-Alton location during that period was 7 ppb at 4:24 AM.
- ◆ Hydrogen sulfide levels were above 10 ppb at the River Street monitor sporadically during several periods between 11:00 PM on Friday, June 25<sup>th</sup> and 1:30 AM on Saturday, June 26<sup>th</sup>. The highest concentration during that period was 26 ppb at 11:49 PM on the 25<sup>th</sup> and the highest one-hour average concentration was 17 ppb. Concentrations were not elevated during that period at the Woodville-Alton monitor.
- ◆ Hydrogen sulfide levels were elevated at the River Street monitor from 3:30 to 5:30 AM on Sunday, June 27<sup>th</sup>. The highest concentration during that period was 23 ppb at 4:59 AM and the highest one-hour average concentration was 21 ppb. Concentrations during that period were not elevated at the Woodville-Alton monitor.
- ◆ Concentrations at the River Street monitor were substantially elevated between 11:00 PM on Sunday, June 27<sup>th</sup> and 8:00 AM on Monday, June 28<sup>th</sup>; in fact, concentrations were at or above 30 ppb almost continuously from 11:54 PM on the 27<sup>th</sup> until 4:39 AM on the 28<sup>th</sup> and again from 6:24 to 7:39 AM on the 28<sup>th</sup>. The highest concentration during that period, recorded at 2:54 AM on the 28<sup>th</sup>, was 84 ppb and the highest one-hour average was 79 ppb. Concentrations between 5 and 16 ppb were recorded at the Woodville-Alton monitor between 7:04 and 9:09 AM on June 28<sup>th</sup>.

In summary, elevated hydrogen sulfide levels occurred during the late night – early morning hours of six of the seven nights between June 15<sup>th</sup> and June 21<sup>st</sup> and on two afternoons during that period at the River Street location, which is close to the Charbert lagoons. Stagnant wind conditions or southerly winds were present at all times that the levels were elevated. Concentrations were lower at the Woodville-Alton Road monitor.

As discussed above, the concentration recorded for one ten-minute interval during the sampling period was at or above 90 ppb, the upper end of the range of concentrations that can be measured with the instrumentation in its current configuration. RI DEM is currently obtaining supplies necessary to configure a monitor to measure higher hydrogen sulfide levels. When those supplies are available, RI DEM plans to operate two monitors side by side at the River Street location, the current monitor measuring the lower range and an additional monitor that would be able to quantify higher concentrations should they occur.

Table A shows the maximum 10-minute, one-hour and 24-hour average concentrations (in ppb) measured by each monitor during the latest and previous monitoring periods.

Table A Maximum Hydrogen Sulfide Levels

Monitor	Date	Maximum 10-minute Level	Maximum 1-hour Level (HEALTH nuisance range is >2 - <100 ppb)	Maximum 24-hour Level (HEALTH nuisance range is >2 - < 30 ppb)
River Street	6/7– 6/14/04	78 ppb	49 ppb	7 ppb
	6/15 – 6/21/04	44 ppb	29 ppb	7 ppb
	6/21 – 6/28/04	90 ppb	79 ppb	15 ppb
Woodville-Alton Rd	5/13 – 6/7/04	6 ppb	2 ppb	0.2 ppb
	6/6 – 6/14/04	27 ppb	19 ppb	3 ppb
	6/15 – 6/21/04	10 ppb	5 ppb	1 ppb
	6/22 – 6/28/04	16 ppb	13 ppb	2 ppb

The levels recorded by the River Street monitor during the June 21<sup>st</sup> – 28<sup>th</sup> period are higher than in the previous two weeks and are well into the range of values that are classified as nuisance levels by the Rhode Island Department of Health (HEALTH). These levels would clearly be associated with a noticeable rotten-egg type odor. HEALTH warns that people exposed to nuisance levels of hydrogen sulfide may experience nausea and stress from the odors, an increase in non-specific symptoms and a possible exacerbation of chronic respiratory symptoms in hypersensitive individuals.

Hydrogen sulfide monitoring is continuing at the two locations. RI DEM also collected two volatile organic compound (VOC) samples in the area on Thursday, June 24<sup>th</sup>. The results of those samples will be reported when available. Note that, although the samples were collected in the early morning hours, when odors and hydrogen sulfide levels are often highest, hydrogen sulfide levels on that morning were lower at the time of the sample collection than they had been earlier in the morning. RI DEM will continue to attempt to collect a VOC sample when hydrogen sulfide levels are substantially elevated or a strong odor is present.

For more information about sampling results, contact Barbara Morin at 222-4700, ext. 7012.